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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,602	02/15/2002	Jeffrey Hung	015290-592	1155

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EXAMINER
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UMEZ ERONINI, LYNETTE T

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 06/13/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/075,602

Applicant(s)

HUNG ET AL.

Examiner

Lynette T. Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 14, 18, 21 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14, 18, 21 and 28-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 21 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Maki (US 5,384,009).

Maki teaches "The process gas lacks oxygen and comprises: (i) a primary etchant selected from the group consisting of **chlorine**, fluorine, and bromine; (ii) a secondary etchant suitable for etching grain boundaries in the substrate; and (iii) xenon (same as inert carrier gas). A gas passivator such as N<sub>2</sub> (same as an inert carrier gas), HCl, CHF<sub>3</sub> (same as applicant's fluorine containing gas), CF<sub>4</sub> (same as applicant's fluorine containing gas), CH<sub>4</sub>, or mixtures thereof, can be added to the process gas (column 2, lines 20-26). Maki further teaches, " . . . more preferably the secondary etchant is selected from the group consisting of BCl<sub>3</sub>, . . . and mixtures thereof (column 2, lines 30-35). The aforementioned reads on,

An oxygen-free plasma etching gas formulation comprising more than one fluorine-containing compound, an optional inert carrier gas, and chlorine, the gas formulation being free of SF<sub>6</sub>. Since Maki uses the same gaseous etchants that comprises the claimed invention, then using Maki's etchant in the same manner as that

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of the claimed invention would result in a gas formulation for removing an organic ARC on a metallic layer. It is noted that "an optional inert carrier gas," is not required by claim 21. Language that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure, does not limit the scope of a claim or claim limitation. Also, no patentable weight is given to the phrase, "for removing an organic ARC on a metallic layer." Likewise the intended use of composition is not patentably significant. *In re Albertson* 141 USPQ 730 (CCPA 1964); *In re Heck* 114 USPQ 161 (CCPA 1957).

### ***Claim Rejections – 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 14, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mak et al. (US '009).

As pertaining to claims 14, 28, and 29, Maki teaches "The process gas lacks oxygen and comprises: (i) a primary etchant selected from the group consisting of **chlorine**, fluorine, and bromine; (ii) a secondary etchant suitable for etching grain boundaries in the substrate; and (iii) xenon (same as inert carrier gas). A gas passivator such as N<sub>2</sub> (same as an inert carrier gas), HCl, CHF<sub>3</sub> (same as applicant's

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fluorine containing gas),  $\text{CF}_4$  (same as applicant's fluorine containing gas),  $\text{CH}_4$ , or mixtures thereof, can be added to the process gas (column 2, lines 20-26). Maki further teaches, " . . . more preferably the secondary etchant is selected from the group consisting of  $\text{BCl}_3$ , . . . and mixtures thereof (column 2, lines 30-35). The aforementioned reads on,

An oxygen-free plasma etching gas formulation comprising  $\text{CHF}_3$ , and  $\text{BCl}_3$ , and the gas formulation being free of  $\text{SF}_6$ . Since Maki uses the same gaseous etchants that comprises the claimed invention, then using Maki's etchant in the same manner as that of the claimed invention would result in a gas formulation for removing an organic ARC on a metallic layer.

Mak differs in failing to teach an etching gas comprising argon, in claim 14.

It is well known in the art that noble gases include helium, argon or nitrogen, neon or xenon and are used as carrier and diluent gases.

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to replace Mak's xenon with argon since both gases are seen as equivalent: they belong to same chemical family and possess the same chemical properties. Hence, substitution of one for the other would have been obvious for the purpose of providing an inert carrier gas.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mak et al. (US '009) in view of Harshbarger et al. (US 4,208,241).

Mak teaches "The process gas lacks oxygen and comprises: (i) a primary etchant selected from the group consisting of chlorine, fluorine, and bromine; (ii) a secondary etchant suitable for etching grain boundaries in the substrate; and (iii) xenon (same as inert carrier gas). A gas passivator such as  $N_2$  (same as an inert carrier gas),  $HCl$ ,  $CHF_3$  (same as applicant's fluorine containing gas),  $CF_4$  (same as applicant's fluorine containing gas),  $CH_4$ , or mixtures thereof, can be added to the process gas (column 2, lines 20-26). Mak further teaches, " . . . more preferably the secondary etchant is selected from the group consisting of  $BCl_3$ , . . . and mixtures thereof (column 2, lines 30-35). The aforementioned reads on,

An oxygen-free plasma etching gas formulation comprising  $CHF_3$  and chlorine, the gas formulation being free of  $SF_6$ . Since Mak's etchant comprises the same gaseous etchant as that of the claimed invention, then using Mak's etchant in the same manner as that of the claimed invention would result in a gas formulation for removing an organic ARC on a metallic layer.

Mak differs in failing to teach an etching gas comprising argon.

It is well known in the art that noble gases include helium, argon or nitrogen, neon or xenon and are used as carrier and diluent gases.

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to replace Mak's xenon with argon since both gases are seen as equivalent: they belong to same chemical family and possess the same chemical properties. Hence, substitution of one for the other would have been obvious for the purpose of providing an inert carrier gas.

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Mak differs in failing to specify the ratio of the sccm flow rates of  $\text{CHF}_3$ :argon:chlorine is 5 to 80: 5 to 80: 5 to 60.

Harshbarger teaches etch gas composition and inlet flow rate that typically ranges for flow rate is 10-500 sccm are parameters that are subject to control in (plasma) reactors (column 8, lines 17-21). Harshbarger's flow rate which ranges from 10-500 sccm shows that the flow rate of an etch gas composition encompasses the flow rate ratio of the etch gas composition as claimed in the present invention and provide evidence that the flow rate is a so-called "result effective variable."

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Mak by using Harshbarger's method of varying the flow rate of an etchant gas, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 703-306-9074. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703-308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703-972-9310 for regular communications and 703-972-9311 for After Final communications.

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June 11, 2003



ROBERT KUNEMUND  
PRIMARY EXAMINER